KANSAS COOPERATIVE PLANT DISEASE SURVEY REPORT

PRELIMINARY 2006 KANSAS WHEAT DISEASE LOSS ESTIMATES

JULY 31, 2006

Corrected copy on August 14, 2006

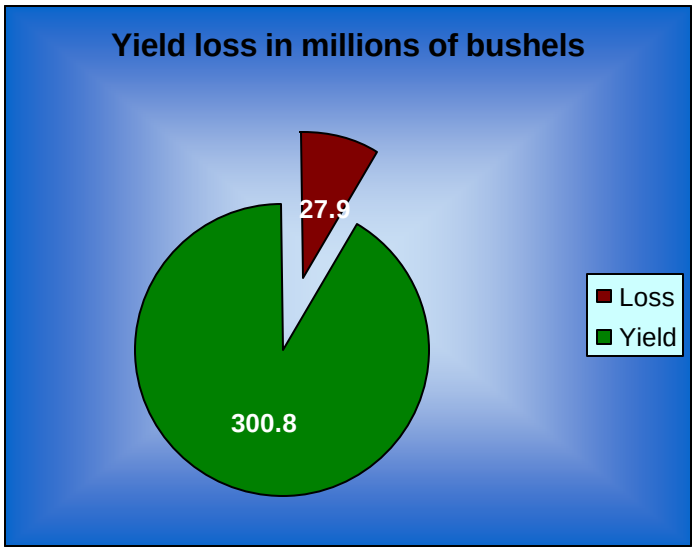
Jon A. Appel, Robert L. Bowden, William W. Bockus, and Doug Jardine

Plant Pathologist, Plant Protection Program, Kansas Department of Agriculture, Topeka, 66612; Research Plant Pathologist, USDA-ARS, Kansas State University, Manhattan, 66506; Professor, Plant Pathology, Kansas State University, 66506; and Extension Specialist, Plant Pathology, Kansas State University, Manhattan 66506

This report may be viewed at the following website of the Kansas Department of Agriculture under documents and reports - http://www.ksda.gov/Default.aspx?tabid=169 .

HIGHLIGHTS The disease loss component of this years harvest was estimated at 8.5 percent of the crop. This 2006 disease loss estimate was considerably lower than the 12 percent twenty year average.

Figure 1. Yield Loss from Disease in 2006



The KANSAS AGRICULTURAL STATISTICS SERVICE July 12 estimate of 300.8 million bushels represented a harvest of 32 bushels per acre on 9.4 million acres. Harvested acreage was down 100,000 acres compared to 2005. In contrast, 200,000 more acres were planted in 2006 than in 2005. The Kansas wheat crop in 2006 suffered from drought and was 20 percent less than the 2005 crop in spite of the additional planted acreage.

The most significant disease was wheat streak mosaic at 7.0 percent loss. This disease was noted as a problem in the fall of 2005 in planted wheat and was epidemic to the crop in much of the western third of the state in the spring of 2006. The second most important disease to the wheat crop was barley yellow dwarf at 0.8 percent followed by tan spot disease at 0.2 percent.

DISEASES

The wheat streak mosaic complex, which includes the wheat curl mite-vectored wheat streak mosaic and High Plains viruses, was the bane to the 2006 wheat crop. The disease was reported in volunteer wheat in September of 2005 during surveillance activities (J. Appel, KDA). In late October and November, observations were made in west central Kansas in planted wheat. The Great Plains Diagnostic Clinic at Kansas

State University received many samples of infected wheat in the fall of 2005 also. Fall conditions were warm and dry which allowed the build up of curl mites. As the wheat started to grow in the spring of 2006 numerous reports of high incidences were made in western Kansas. Drought compounded the stress from the viral disease upon the crop as many fields struggled to grow. Significant acreages were abandoned because of the combined effects of drought and virus infection.

Figure 2. WSM infested wheat in TregoCounty that should have been heading.

Wheat streak mosaic was also significant in the central region of the state with the western edge of this region the hardest hit. A few reports were made in northeast and southeast Kansas as conditions were favorable for the curl mite and virus.

In west central Kansas, 18.1 percent of the crop was lost to wheat streak mosaic which included a huge 38% loss on susceptible cultivars. In the northwest crop reporting district, 9.1 percent was lost and in southwest Kansas 15 percent was lost to wheat streak. The central part of the state fared somewhat better but still had substantial losses. North central Kansas had an estimated 7.2 percent loss and central Kansas had 3.9 percent loss overall. South central had better numbers with an estimate of 1.8 percent loss. Overall, the state lost 7 percent or 23 million bushels to the viral complex. The twenty year average loss for WSM was 2.0 percent and the 2006 loss was the second worst since estimates began in 1976.

Barley yellow dwarf virus had a somewhat similar story as wheat streak mosaic. BYD is transmitted by aphids and the fall was conducive to the increase in vector numbers. Surveillance in the fall noted aphid numbers in west central and south central Kansas. In the spring, substantial incidence of disease was noted in select areas within the eastern three quarters of the state. In 2005, loss was minimal in the state with few reports of the disease and an estimated 0.01 loss. In contrast, 2006 had 0.8 percent loss estimated but still below the twenty year average loss of 1.4 percent.

Tan spot came in as the third most important disease. The disease was estimated at 0.2 percent loss in 2006 and compared to 1.1 percent loss for the twenty year average. Disease was noted in continuous cropped wheat in the central regions of the state. Other foliar diseases such as leaf rust, stripe rust, powdery mildew, and the *Septoria* complex were all negligible because of the extreme dry conditions. Leaf rust annually is the most important disease to Kansas wheat at 3.7 percent. Surprisingly, the loss estimate for leaf rust for 2006 was only 0.1 percent.

Some diseases that were up in incidence included common bunt especially in north central Kansas. It was reported to cause some rejection at local elevators. Dry land foot rot had several reports in the western third of the state.

No reports of stem rust, Karnal bunt, or *Cephalosporium* stripe were made in 2006.

Figure 3. Three most important diseases in 2006

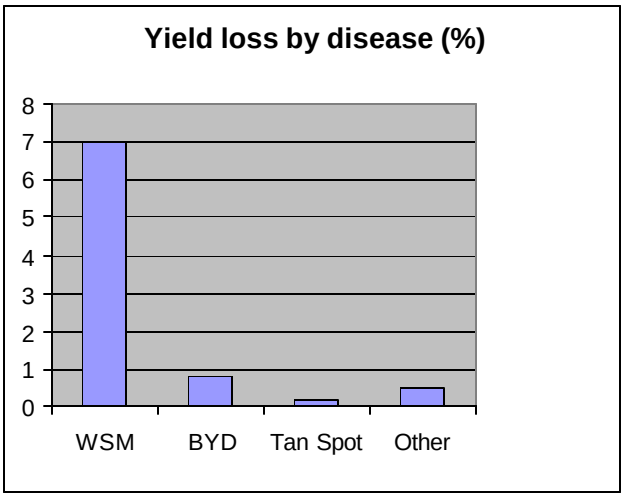


Table 1. Loss estimates by disease for 2004-2006.

DISEASE				20YR
	2004	2005	2006	AVE
LEAF RUST	1.4	2	0.1	3.30
WHEAT STREAK COMPLEX	0.4	2	7	2.04
SEPTORIA COMPLEX	0.05	0.1	0.001	0.96
SOILBORNE MOSAIC COMPLEX	0.001	0.05	0.05	0.42
TAN SPOT	0.3	0.6	0.2	1.07
BARLEY YELLOW DWARF VIRUS	0.2	0.01	0.8	1.38
TAKE ALL	0.2	0.001	0.05	0.26
CEPHALOSPORIUM STRIPE	0	0.001	0	trace
ROOT & CROWN ROT COMPLEX	0.01	0.01	0.1	0.15
POWDERY MILDEW	0.8	0.1	0.1	0.22
SCAB	0.01	0.001	0.001	0.21
STEM RUST	0.001	0	0	0.06
STRAWBREAKER	0	0	0.001	0.02
BACTERIAL LEAF BLIGHT	0.001	0.001	0.001	0.02
BUNT & LOOSE SMUT	0.02	0.01	0.05	0.01
STRIPE RUST	0.01	8	0.001	1.30
AMERICAN WHEAT STRIATE	0	0	0.001	trace
SNOW MOLD	0	0	0	trace
TOTAL	3.4	12.9	8.5	11.39

:stimates prepared by Kansas State University, Kansas Department of Agriculture and USDA-ARS personnel. Estimates are based on expert opinions, but are not statistically designed.
:stimates utilize a disease survey lab diagnostic results, cultivar resistance, cultivar acreages, crop district yield estimates, and loss functions or estimates for each disease.
race amounts were entered as 0.001. Blanks indicate no loss estimate made.
WSMV includes other curl mite vectored viruses eg High Plains Mosaic Virus